Assume that Q1 and Q2 and the resistors $R_C$ of the differential amplifier shown are matched. If $\beta_f = 100$, $V_i = 25\text{mV}$, $V_{BE} = 0.7\text{V}$ and $V_A = \infty$, find (a.) the numerical value of $I_{C1}$ and $I_{C2}$ if $v_1 = v_2 = 0$. (b.) Assume that $I_{C1} = I_{C2} = 0.5\text{mA}$ and find the numerical value of $v_{C1}/v_{id}$ where $v_{id} = v_1 - v_2$. (c.) Continuing to assume that $I_{C1} = I_{C2} = 0.5\text{mA}$, find the numerical value of $v_{C1}/v_{ic}$ where $v_{ic} = v_1 = v_2$. 

\[ \text{Diagram with circuit symbols and component values} \]